

## ABSTRACT OF THE DISCLOSURE

A method for forming an epitaxial layer involves depositing a buffer layer on a substrate by a first deposition process, followed by deposition of an epitaxial layer by a second deposition process. By using such a dual process, the first and second deposition processes can be optimized, with respect to performance, growth rate, and cost, for different materials of each layer. A semiconductor heterostructure prepared by a dual deposition process includes a buffer layer formed on a substrate by MOCVD, and an epitaxial layer formed on the buffer layer, the epitaxial layer deposited by hydride vapor-phase deposition.